Claims

[c1] What is claimed is:

1. A kinetic energy projectile comprising:

a penetrator;

a sleeve composed of a shape memory alloy that is thermally shrunk around the penetrator;

the sleeve capable of heating up during flight, and expanding to form the penetrator to provide a separation between the sleeve and the penetrator; and

wherein upon target impact, the sleeve only minimally penetrates the target and allows the penetrator to slide through the sleeve into the target, thus enhancing the target penetration capability of the penetrator.

[c2] 2. The projectile of claim 1, further comprising a nose assembled to a front end of the penetrator.

[c3] 3. The projectile of claim 2, further comprising a fin assembled to a rear end of the penetrator.

[c4] 4. The projectile of claim 3, further comprising a sabot secured to the sleeve.

[c5] 5. The projectile of claim 4, further comprising a retaining ring that holds the sabot together.

[c6] 6. The projectile of claim 5, further comprising an obturator that is

secured to the sabot.

[c7] 7. The projectile of claim 1, wherein the shape memory alloy of the sleeve is trained to fit an outer diameter of the penetrator at a specific expansion temperature and contract at a specific contraction temperature to provide support to the penetrator during launch of the kinetic energy projectile.

[c8] 8. The projectile of claim 7, wherein the shape memory alloy of the sleeve is trained to expand at a specific expansion temperature and contract at a specific contraction temperature that is cooler than the expansion temperature.

[c9] 9. The projectile of claim 8, wherein the shape memory alloy of the sleeve is trained to be slightly larger than the penetrator at the expansion temperature to allow the penetrator to slide through the sleeve and to penetrate a target without the sleeve.

[c10] 10. The projectile of claim 8, wherein the sleeve is provided with a slot along the length of the sleeve for ease of manufacturing, and ease of expansion when the projectile is subjected to aerodynamic heating, and ease of contraction when the projectile is subjected to the contraction temperature.

[c11] 11. The projectile of claim 1, wherein the sleeve comprises a sub-sleeve that is secured together by a plurality of rings.

[c12] 12. The projectile of claim 11, wherein the sub-sleeve is

comprised of a hollow cylinder that is segmented into a plurality of sections along a circumference of the hollow cylinder.

[c13] 13. The projectile of claim 12, wherein the sub-sleeve is made of steel.

[c14] 14. The projectile of claim 12, wherein the sub-sleeve is made of a plastic composite.

[c15] 15. The projectile of claim 11, wherein the rings are comprised of the shape memory alloy.

[c16] 16. The projectile of claim 15, wherein the rings comprise a slotted ring.

[c17] 17. The projectile of claim 15, wherein the shape memory alloy of the rings is trained to fit an outer diameter of the sub-sleeve at the contraction temperature, to compress the sub-sleeve and to provide support to the penetrator during the launch of the kinetic energy projectile.

[c18] 18. The projectile of claim 15, wherein the shape memory alloy of the rings is trained to be slightly larger than an outer diameter of the sub-sleeve at the expansion temperature to allow the penetrator to slide through the sleeve and to penetrate a target with minimal penetration of the sleeve.